

**Symposium Proposal for the Movement: Brain, Body and Cognition Conference,
Harvard Medical School, Cambridge, Massachusetts
July 28, 2018**

Title:

Cultivating Neuroplasticity through Interoception in Somatic Movement Practices: Evolving Research Methods.

Abstract:

Somatic, or consciously sensed, movement is associated with neuroplasticity, including increased interoception. Experts in this professional field present data from clinical case studies and quantitative research projects, and address the need for new research methods to measure the multidimensional effects of mindful movement on cognition.

Summary:

The field of somatic movement encompasses a range of educational and therapeutic systems which have developed largely outside mainstream Western frameworks. They broadly include methods which have grown up in the West over the last century such as the Alexander Technique, the Feldenkrais Method, Body-Mind Centering, and Continuum. These methodologies, which cultivate conscious awareness in movement, originate in educational and therapeutic systems directly oriented to improving human health and well-being. As such, their underlying conceptual frameworks were designed to promote this goal, rather than to promote scientific research. With recent developments in fields such as embodied cognition, affective neuroscience, and relational neuroscience, it has become possible to translate the disparate conceptual frameworks of somatic movement systems into a common scientific framework. This enables these systems to be investigated quantitatively, and to connect with the increasingly large body of research into movement and interoception, and their relation to cognition, affect, and social engagement. Based on decades of clinical experience, the somatic movement systems offer a wealth of practical knowledge, the study of which may greatly enhance the scientific understanding of the integrated functioning of the human nervous system.

This symposium will present four expert perspectives on the impact of somatic movement practices on neuroplasticity and interoception. Some of the presenters will discuss clinical case studies, while another will relate quantitative data. First, Dr. Martha Eddy will present the ground-breaking cases of increased neuroplasticity among the founding figures of the field of somatic movement, and then will discuss a current application of somatic movement practices that support interoception and motivation and capacity for exercise in breast cancer survivors. Next, osteopathic physician, Bonnie Gintis, will present data from 30 years of experience teaching awareness of breath, movement and internal sensations to medical students and patients with chronic illnesses. She postulates that her approach fosters interoception in order to grow awareness not only about the self, but also about the “others” with whom they work, giving rise to empathy and compassion. Peter Payne will then discuss his statistically significant findings about the effect of somatic movement practices on interoception (measured by the MAIA, the Multidimensional Assessment of Interoceptive Ability) and stress resilience among flight attendants exposed to second-hand smoke. Finally, Dr. Martha Herbert will outline the limitations of metric-centered research and assert the need to develop new methods that reflect

the multidimensionality of movement interventions characterized by subjectivity, interoception, and personalization.

Elisabeth Osgood-Campbell will facilitate the proceedings of the symposium as Chair. Dr. Mardi Crane-Godreau will act as the Discussant, further elucidating connections among the presentations. Please find biographical summaries for these two contributors below.

Bio:

Dr. Mardi Crane-Godreau is a dynamic thought leader who has gathered like-minded scholars into collaborations ranging from earlier research in immunology to current collaborations on somatic practices that challenge Cartesian paradigms. She leads a guest editorial team at *Frontiers in Neuroscience* for the research topic ‘*Somatic and Bodymind Approaches to Resilience.*’ Since 2013, she and Peter Payne have pursued clinical research as well as addressing theoretical issues involved in the scientific investigation of somatic practices. Recent publications include a proposed conceptual framework for exploring mechanisms of somatic movement approaches. She is especially interested in finding ways to teach somatic movement via digital media. One current project involves the development (in conjunction with Dartmouth’s DALI Lab) of an app to improve somatic awareness and self-regulation in children with autism spectrum disorder. Dr. Crane-Godreau received her PhD from Dartmouth College where she is an Assistant Professor in the Department of Microbiology and Immunology.

Bio:

Elisabeth Osgood-Campbell, MA, EdM, is a dancer, educator, and researcher who investigates the impact of movement on cognition across the lifespan. This experiential and academic inquiry conducted in various contexts, including the Harvard Graduate School of Education and Tamalpa Institute, shapes her teaching and performance work. She is a Registered Somatic Movement Educator through the International Somatic Movement Education and Therapy Association (ISMETA) and has served on that Board of Directors for nine years. Currently, she acts as the Chair of the Research and Publications Committee for ISMETA and is the author of an academic article on the educational implications of the philosophical concept of embodied cognition.*

*Osgood-Campbell, E. (2015). Investigating the Educational Implications of Embodied Cognition: A Model Interdisciplinary Inquiry in Mind, Brain, and Education Curricula. *Mind, Brain, and Education*, 9(1), 3-9.

Presenter Information

Chair: Elisabeth Osgood-Campbell, Harvard Graduate School of Education, Cambridge, Massachusetts, USA

Presenter 1: Dr. Martha Eddy, St. Mary's College, Moraga, USA:
Overcoming Movement Limitations through Interoception in Somatic Movement Practices: Pioneers' Case Studies and Current Applications among Cancer Survivors.

Presenter 2: Bonnie Gintis, Physician in private practice, Mindfulness Based Stress Reduction instructor and Continuum Teacher, Burlington, VT, USA: *Breath and Body Awareness in Somatic Movement Practices Augments Awareness of Self and Others.*

Presenter 3: Peter Payne, Geisel School of Medicine at Dartmouth College, Dartmouth, New Hampshire, USA: *The Impact of a Somatic Movement Intervention on Interoceptive Ability and Stress Resilience among Flight Attendants Exposed to Second-hand Smoke.*

Presenter 4: Dr. Martha Herbert, Founder and Director Emeritus, TRANSCEND Research Program, Neurology Department, Massachusetts General Hospital, Harvard Medical School, Boston Massachusetts, USA: *Movement Research with Fidelity to Practice-Driven Transformation.*

Discussant: Dr. Mardi Crane-Godreau, Geisel School of Medicine, Dartmouth College, Dartmouth, New Hampshire, USA

Overcoming Movement Limitations through Interoception in Somatic Movement Practices: Pioneers' Case Studies and Current Applications among Cancer Survivors

Martha Eddy

St Mary's College, Moraga, California, USA

Montclair State University, Montclair, New Jersey, USA

University of North Carolina – Greensboro, USA

Moving for Life, Co-Founder and Director, New York, New York, USA

Dynamic Embodiment, Founder, New York, New York, USA

Correspondence: drmarthaeddy@gmail.com

Key words: Somatic movement, neuroplasticity, interoception, breast cancer

Objective:

To present a history of ground-breaking case studies in the field of somatic movement education as they demonstrate the neuroplasticity of the human nervous system, through cultivation of interoception and proprioception, as it occurs during movement experience and contributes to kinesthesia.

Also, to describe an application of somatic movement practice for breast cancer survivors who gain increased mobility and a sense of agency.

Methods:

At the turn of the twentieth century, movement anomalies and crises would often result in permanent disabilities. However, various artists, scientists, and medical professionals around the world chose to find ways to overcome the negative diagnoses of NOT being able to walk, talk or easily breathe. Case studies of Moshe Feldenkrais, F.M.Alexander, Gerda Alexander, Mabel Todd and a few others who form the "pioneering first generation" of somatic education will be discussed (Johnson, 1995; Eddy 2016). Then, a current application of somatic movement among breast cancer survivors, in which women report improved body mass index and enhanced motivation and capacity to exercise will be presented.

Results:

The successes of the pioneers mentioned above developed out of movement explorations that fostered a heightened awareness of their own bodies through, what we now refer to as, interoception and proprioception. Somatic movement practices from a variety of unrelated originators share the common elements of slowing down, entering a neutral state of non-judgment (a beginner's mind), sensing self as alive and three-dimensional, approaching breath as primary movement, and returning to neuro-developmental roots of movement that allow for improved mobility and self-awareness.

Conclusion:

Sensing of bodily self through interoception and proprioception can cultivate neuroplasticity, increasing motivation and capacity to exercise among individuals with limited movement capacities. Applications of somatic movement work may facilitate improved outcomes in the fields of healthcare, the arts, and in K12 as well as higher education.

References:

Eddy, M. (2016). *Mindful movement: The evolution of the somatic arts and conscious action*. Bristol, UK: Intellect Press.

Johnson, D. (1995). *Bone, breath and gesture: Practices of embodiment*. Berkeley, CA: North Atlantic Books.

Bio:

Dr. Martha Eddy is a Registered Somatic Movement Therapist, Teacher of Body-Mind Centering, and Certified Movement Analyst with a doctorate in Movement Science, who has served on the faculty at Empire State Graduate Center, State University of New York, Columbia University, and Princeton University. She is the founder of the non-profit organization Moving for Life as well as the somatic movement therapy training, Dynamic Embodiment. Past president of the International Somatic Movement Education and Therapy Association, she is also the author of *Mindful Movement: The Evolution of Somatic Arts and Conscious Action*.

Breath and Body Awareness in Somatic Movement Practices Augments Awareness of Self and Others

Bonnie Gintis

Physician in private practice, Mindfulness Based Stress Reduction instructor and Continuum Teacher, Burlington, VT, USA

Correspondence: bonnie@bonniegintis.com

Key words: somatic movement, interoception, breath, Continuum

Objectives:

To describe the principles and practices of awareness of breath, body movements, internal sensations, and meditation.

To inquire into the effects of these interoceptive skills in my medical students, patients, and workshop participants.

To evaluate the impact of this increased interoceptive skill on empathy and compassion in professional and personal contexts.

Methods:

Breath awareness activities are taught in a variety of contexts, from individual patients to medical student training at the American Academy of Osteopathy to workshops for Transformative Self Care for people facing chronic illness. These activities integrate aspects of Continuum practice, which explores the effect of movement, breath, and sound on musculoskeletal and connective tissue texture, kinesthetic sense, proprioception, and sense of internal visceral activity. Meditation practice that uses the awareness of breath and other sensations to remain anchored in the present moment is also implemented.

Results:

All of my approaches to practice involve interoception as a valuable path to deeper awareness of self and of others. Recent findings in neuroscience research have shown that regular engagement in interoception-based practices leads to changes not only in temporary states of consciousness, but in more permanently altered traits that are reflected in changes of structure and function of the dorsolateral prefrontal cortex (regulates executive function), the hippocampus (governs learning and memory), and the amygdala (involved in processing emotions, memory, fear, anxiety) areas of the brain, and improved autonomic regulation.

My students and patients subjectively self-report an overall improved sense of health and wellbeing, as well as an increased sense of empathy and compassion for others, which is an enhancement to clinical practice and personal self-care and relationships.

Conclusions:

Based on decades of clinical practice and teaching, the somatic movement practices of tracking breath, movement, and other internal bodily sensations has helped people develop greater perceptual awareness and connect more deeply to themselves and others.

Bio:

Bonnie Gintis, DO, is an osteopathic physician, Continuum teacher, mindfulness meditation instructor, and Registered Somatic Movement Educator through the International Somatic Movement Education and Therapy Association. She has synthesized her approach to facilitating healing processes through 20 years of study and teaching Continuum with Emilie Conrad, 30 years of osteopathic practice, and 45 years of meditation. Author of *Engaging the Movement of Life: Exploring Health and Embodiment Through Osteopathy and Continuum*, Bonnie is a graduate of New York College of Osteopathic Medicine and has taught Continuum, mindfulness meditation, and osteopathic principles and practice, and manipulative medicine worldwide. For more info, go to www.bonniegintis.com

The Impact of a Somatic Movement Intervention on Interoceptive Ability and Stress Resilience among Flight Attendants Exposed to Second-hand Smoke

Peter Payne

Geisel School of Medicine at Dartmouth College, Dartmouth, New Hampshire, USA

Correspondence: ppptfe@gmail.com

Key words: somatic movement, interoception, stress resilience

Objective:

To develop, and test the health benefits of, a somatic movement intervention with flight attendants exposed to second-hand cigarette smoke (mean age 68).

Methods:

Phase 1: A non-controlled pilot study (N=12) to develop the intervention and test it with in-person instruction over 4 months [1]. The intervention was based on the researchers' previously developed framework of the neuroscience of somatic movement [2]. Phase 2 (N=37) tested the intervention delivered by video only in a randomized controlled trial [3]. In Phase 3 we will test improved videos in another RCT. Principal outcome measures were the six-minute walk test (6MWT) and C-reactive protein (CRP). Secondary measures included the Multidimensional Assessment of Interoceptive Ability (MAIA) [4] and autonomic, cardio-pulmonary, hormonal and affective measures.

Results:

Participant feedback guided the development of an intervention based on everyday movements and requiring minimal time and exertion for practice. Self-report indicated high levels of satisfaction and improved body awareness and stress resilience. Pre-post testing in Phase 1 showed significant and substantial improvements in the 6-minute walk test (6MWT), systemic inflammation, the MAIA, and cardiovascular, pulmonary, autonomic and affective measures. Phase 2 confirmed the majority of these results, although significance levels were lower than in Phase 1. ANOVA showed significant ($p < 0.005$) 7% increase in the 6MWT (vs. a 2% drop in the control group); a 32% drop in the COPD Assessment Test score (vs. a 12% increase in the control group, $p < 0.01$); and a 24% improvement in the MAIA (vs. no change in the control, $p < 0.005$). Strong but non-significant trends paralleled significant results from Phase 1 in DHEAS levels, CRP, and autonomic and affective measures. The MAIA Self-Regulation subscore mirrored self-report of improved stress resilience: 26% improvement in the intervention group vs 2% in the control group ($p < 0.05$).

Conclusion:

A somatic movement intervention requiring minimal time and effort is effective in improving a wide range of health measures in the elderly, and can be effectively delivered by video. It is notable that endurance improved significantly despite no metabolic load from practice. This and other results may reflect improved nervous system function related to improved interoception and autonomic self-regulation.

1. Payne, P., et al., *Effectiveness of a novel qigong meditative movement practice for impaired health in flight attendants exposed to second-hand cigarette smoke*. 2017: Frontiers in Human Neuroscience
2. Payne, P. and M.A. Crane-Godreau, *The preparatory set: A novel approach to understanding stress, trauma, and the bodymind therapies*. Front Hum Neurosci, 2015. **9**: p. 178.
3. Payne, P., et al., *Meditative movement as a treatment for pulmonary dysfunction in flight attendants exposed to second-hand cigarette smoke: Study protocol for a randomized trial*. Frontiers in Psychiatry, 2016. **7**.
4. Mehling, W.E., et al., *The Multidimensional Assessment of Interoceptive Awareness (MAIA)*. plos-One, 2012. **7**(11).

Bio:

Peter Payne is a researcher at the Geisel School of Medicine at Dartmouth College and a Registered Somatic Movement Educator. He is a teacher and practitioner of meditation, Qigong, and Tai Chi, and a certified practitioner of Somatic Experiencing trauma therapy and the Alexander Technique of postural re-education. He has a life-long interest in clarifying the links between neuroscience and somatic practice. A primary author on 6 peer-reviewed papers on the subject, he has proposed neurological models to account for the effects of Qigong, Somatic Experiencing, and the Somatic disciplines generally. He is currently developing video- and virtual reality-based methods for teaching somatic movement. He has taught Master's level courses in anatomy, somatics, and neuropsychology at several colleges, and holds a B.A. in Social Relations from Harvard University.

Movement Research with Fidelity to Practice-Driven Transformation

Martha Herbert

Founder and Director Emeritus, TRANSCEND Research Program, Neurology Department,
Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts, USA
Higher Synthesis Foundation
Anat Baniel Method-NeuroMovement® Practitioner

Correspondence: martha.herbert@mgh.harvard.edu

Key words: Body-brain, movement, learning, research methods

Objective:

To describe the evolutionary rationale for movement as a primordial aspect of human learning, to explain why movement practices aimed at upgrading the complexity and integration of the brain's learning and experiencing capacities can be transformative personally and beyond, to consider the challenges posed by using "objective" methods to study activities and processes which have subjectivity and interoception and personalization as essential dimensions, and to reflect upon how to develop a culture of research within such practices that includes both rigorous observation and reflection and fidelity to the richness and multidimensionality of the work.

Methods:

1. Articulation of a range of purposes for research on movement and the relationship of purposes to methods
2. Articulation of risks of mismatching purpose and method
3. Presentation of advantages, disadvantages and core challenges in registries, metric-centered research and efficacy trials
4. Developing powers of self-reflection and observation within and between practitioners

Results:

As this is a plan for future work rather than a presentation of existing work, the present results are mainly an increasing ferment of ideas and enrichment of intentions, and a growing community involved in addressing the challenges.

Conclusion:

Development of a research program or strategy fully commensurate with the multidimensionality of movement practices requires creating some kind of higher synthesis that integrates a) the emergence technologies with ever-increasing sensitivity to subtle changes in brain and nervous system, b) the ability of skilled practitioners to detect and respond to phenomena beyond the limits of detection of current technologies, c) ways of characterizing transformative and transcendent experiences, d) how to utilize medicalized metrics to demonstrate outcomes such as "symptom relief" without restriction of work to this level, e) identifying or articulating metaprinciples that allow characterization of phenomena that are not and cannot be standardized,

and f) considering how there might be reciprocal benefit where movement practices and sensibilities could enrich science while a culture of research could enrich practices.